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CHROMOSOME NUMBERS IN MEXICAN AND GUATEMALAN COMPOSITAE¹

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The chromosome numbers reported here were obtained from bud material collected by Beaman in the summer of 1960. The counts were made by Turner (except in *Seigesbeckia* which Beaman examined) from pollen mother cell squashes as outlined by Turner and Ellison (1960). The voucher specimens were determined by Beaman, except

¹Supported by National Science Foundation grants G-9025 and G-9045.

Helianthella quinquenervis which was determined by Dr. C. B. Heiser, Jr., and they are deposited in the Michigan State University Herbarium. A nearly complete set is also in the Herbarium of the University of Texas. All material studied is listed in Table 1.

DISCUSSION

EUPATORIEAE — *Piqueria pilosa* ($n=12$). Turner, Powell, and King (1962) reported two other collections of this species as $n=12$.

ASTEREA — *Erigeron coronarius* ($n=18$). Diploid counts of $n=9$ were obtained by De Jong and Longpre (unpublished) in two Durango collections of this species. *E. coronarius* as presently understood is polymorphic, and further study may indicate that the variations are correlated with chromosomal races.

Xanthocephalum linearifolium ($n=4$). The count in this collection was noted by Solbrig (1961) who reported counts for three species of *Xanthocephalum*.

HELIANTHEAE — *Bidens triplinervia* var. *macrantha* ($n=12$). Tetraploid and hexaploid populations of this widely distributed and variable taxon occur on the Guatemalan volcanoes of Pleistocene or recent age (Beaman, De Jong, and Stoutamire, 1962). This diploid material comes from the older, non-volcanic Sierra de los Cuchumatanes.

Jaegeria petiolaris ($n=9$). Turner, Powell and King (1962) have found two other species (*J. pedunculata* Hook. & Arn. and *J. hirta* Less.) with $n=18$. The present report establishes the tetraploid nature of the other counts.

Calea sp. ? ($n=16$). Turner et al. (1961 (1962) have reported approximate counts of $n=16$, 17, and 18 for several other species, and they have obtained a definitive count for only one species, *C. trichotoma* with $n=18$. The generic determination of our material may possibly be in error; if it belongs to the genus *Calea*, it is apparently undescribed.

Siegesbeckia nudicaulis ($n=15$), *S. repens* ($n=15$), *S. triangularis* ($n=15$). The first two of these species are very restricted endemics, while the latter is more widespread and may be conspecific with *S. orientalis* (*sens. lat.*) in which Diers (1961) found $n=15$.

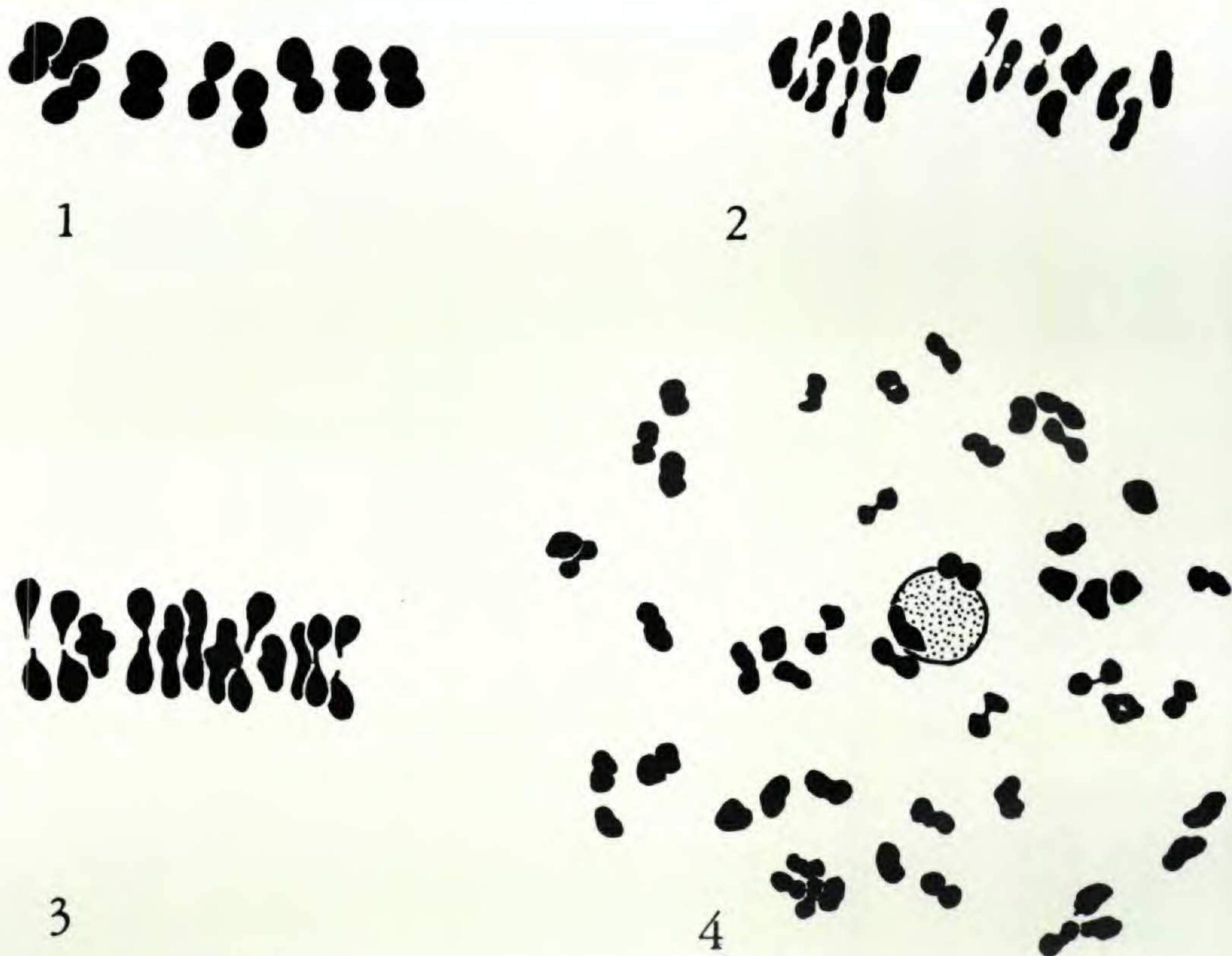
HELENIEAE — *Microspermum debile* ($n=12$). This is the first count reported in this small and little collected genus.

SENECIONEAE — *Werneria nubigena* ($n=50$). Counts in 13 species of *Werneria*, including a count of $2n=212\pm 8$ in *W. nubigena*, were reported by Diers (1961). All but one species he investigated had somatic numbers of 100 or higher.

SUMMARY

Meiotic chromosome counts are reported for 25 species of

Mexican and Guatemalan Compositae. These include the first counts published for 16 taxa. The first report is given for the genus *Microspermum* ($n=12$). A count of $n=9$ was found for *Jaegeria petiolaris*, thus establishing the tetraploid nature of previous chromosome reports of $n=18$ for this genus. Numbers consistent with established basic numbers or previously reported counts were found in *Piqueria*, *Erigeron*, *Grindelia*, *Heterotheca*, *Xanthocephalum*, *Helianthella*, *Sanvitalia*, *Siegesbeckia*, *Viguiera*, *Florestina*, *Hel-enium*, *Cacalia*, *Senecio*, *Cirsium*, and *Hieracium*. Numbers differing with previously reported counts or basic numbers were obtained in *Bidens triplinervia* var. *macrantha* ($n=12$), *Calea* sp. ? ($n=16$), and *Werneria nubigena* ($n=50$). — DEPARTMENT OF BOTANY AND PLANT PATHOLOGY, MICHIGAN STATE UNIVERSITY, EAST LANSING; PLANT RESEARCH INSTITUTE, THE UNIVERSITY OF TEXAS, AUSTIN.



Figs. 1-4. Meiotic chromosomes of selected species, approximately $\times 2000$. Fig. 1. *Jaegeria petiolaris* ($n=9$). Fig. 2. *Calea* sp. ? ($n=16$). Fig. 3. *Microspermum debile* ($n=12$). Fig. 4. *Werneria nubigena* ($n=50$).

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TABLE 1. Summary of collections studied.

| Taxon | Locality | <i>n</i> chromosome number |
|---|---|----------------------------|
| EUPATORIEAE | | |
| <i>Piqueria pilosa</i> H.B.K. | State of Mexico. Nevado de Toluca, northwest side of mtn., ca. 3715 m. alt. <i>Beaman 3471</i> . | 12 |
| ASTEREAE | | |
| <i>Erigeron coronarius</i> Greene | State of Mexico. 5 kilometers north of Atlacomulco, ca. 2500 m. alt. <i>Beaman 3370</i> . | 18 |
| <i>E. scaposus</i> DC. | State of Mexico. 6 kilometers north of Atlacomulco; ca. 2500 m. alt. <i>Beaman 3358a</i> . | 18 |
| <i>Grindelia inuloides</i> Willd. | Nuevo Leon. Cerro Potosí, summit of mtn., ca. 3650 m. alt. <i>Beaman 3346</i> . | 6 |
| <i>Heterotheca inuloides</i> Cass. var. <i>inuloides</i> | State of Mexico. 3 kilometers southeast of Amecameca; ca. 2500 m. alt. <i>Beaman 3474</i> . | 9 |
| <i>Xanthocephalum lineari- folium</i> (DC.) Greenman | Distrito Federal, Mexico. At La Cima Station between Mexico and Cuernavaca, 3035 m. alt. <i>Beaman 3653</i> . | 4 |

HELIANTHEAE

| | | |
|---|--|-------------|
| <i>Bidens triplinervia</i> var. <i>macrantha</i> (Wedd.) Sherff | Guatemala. Dept. of Huehuetenango. Between Tojiah and Chemal at Km. 319.5 on Ruta Nacional 9 N, ca. 3380 m. alt. <i>Beaman 3743.</i> | 12 |
| <i>Helianthella quinquenervis</i> (Hook.) A. Gray | Nuevo Leon. Cerro Potosí, near summit of mtn. on northeast side, ca. 3600 m. alt. <i>Beaman 3339.</i> | 15 |
| <i>Jaegeria petiolaris</i> Robins. | Michoacan. In large llano ca. 4 kms. southeast of Cerro San Andres, ca. 10 kms. (straight line distance) north of Ciudad Hidalgo, ca. 2930 m. alt. <i>Beaman 4245.</i> | 9 (Fig. 1) |
| <i>Calea</i> sp. ? | Guatemala. Dept. of Huehuetenango. Between Tojiah and San Juan Ixcay at Km. 323.5 on Ruta Nacional 9 N, ca. 3200 m. alt. <i>Beaman 3956.</i> | 16 (Fig. 2) |
| <i>Sanvitalia procumbens</i> Lam. | Puebla. 1.5 miles west of Chachapa, ca. 2300 m. alt. <i>Beaman 3615.</i> | 8 |
| <i>Siegesbeckia nudicaulis</i> Standl. & Steyerm. | Guatemala. Dept. of Huehuetenango, between Tojiah and San Juan Ixcay at Km. 324.5 on Ruta Nacional 9 N, ca. 3140 m. alt. <i>Beaman 3844.</i> | 15 |
| <i>S. repens</i> Robins. & Greenm. | Oaxaca. Llano de las Flores, on the Oaxaca-Valle Nacional highway 20 kilometers east of Ixtlan, ca. 2870 m. alt. <i>Beaman 3699.</i> | 15 |
| <i>S. triangularis</i> Cav. | Guatemala. Dept. of Huehuetenango, between Tojiah and San Juan Ixcay at Km. 323.5 on Ruta Nacional 9 N, ca. 3200 m. alt. <i>Beaman 3849.</i> | 15 |
| <i>Viguiera hemsleyana</i> Blake | Oaxaca. On the Oaxaca-Valle Nacional highway, 8 miles east of Ixtlan, ca. 3600 m. alt. <i>Beaman 3662.</i> | ca 34 |

HELENIEAE

| | | |
|--|--|----|
| <i>Florestina pedata</i> (Cav.) Cass. | Puebla. 1.5 miles west of Chachapa, ca. 2300 m. alt. <i>Beaman 3616.</i> | 10 |
| <i>Helenium hoopesii</i> A. Gray | Nuevo Leon. Cerro Potosí, sum- | 15 |

- Microspermum debile*
Benth. mit of mtn., *ca.* 3650 m. alt. *Beaman* 3347. 12 (Fig. 3)
Oaxaca. On the Oaxaca-Valle Nacional highway, on Cerro Pelong, 25.5 miles east of Ixtlan, *ca.* 2950 m. alt. *Beaman* 3663.
- SENECIONEAE**
- Cacalia peltata* H.B.K. Puebla. 5.3 miles southwest of San Salvador el Seco; *ca.* 2500 m. alt. *Beaman* 3619. 30
- Senecio conzattii* Greenm. Oaxaca. Llano de las Flores, on the Oaxaca-Valle Nacional highway 20 kms. east of Ixtlan, *ca.* 2870 m. alt. *Beaman* 3700. 20
- S. iodanthus* Greenm. Michoacan. Summit of Cerro San Andres, *ca.* 12 kms. (straight line distance) north of Ciudad Hidalgo, 3589 m. alt. *Beaman* 4241. 20
- Werneria nubigena* H.B.K. Guatemala. Dept. of Huehuetenango. Between Tojiah and Chermal at Km. 319.5 on Ruta Nacional 9 N, *ca.* 3380 m. alt. *Beaman* 3741. 50 (Fig. 4)
- CYNAREAE**
- Cirsium skutchii* Blake Guatemala. Dept. of Huehuetenango. Between Tojiah and Chermal at Km. 319.5 on Ruta Nacional 9 N, *ca.* 3380 m. alt. *Beaman* 3742. 17
- CICHORIEAE**
- Hieracium mexicanum* Less. State of Mexico. Iztaccihuatl, south side of mtn. at La Joya, *ca.* 3990 m. alt. *Beaman* 3501. 9
- H. selerianum* Zahn Guatemala. Dept. of Huehuetenango. Between Tojiah and Chermal at Km. 317.5 on Ruta Nacional 9 N, *ca.* 3400 m. alt. *Beaman* 3802. 9